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Procalcitonin Versus Serial Quantitative C-Reactive Protein for Guiding Antibiotic Therapy in Children with Suspected Sepsis in Resource Limited Settings: A Critically Appraised Topic

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Abstract

Background: In children with suspected sepsis, antibiotics are often started early but many do not go on to have proven bacterial infection. In resource limited settings, clinicians therefore need tools that can support safer antibiotic review without relying on expensive or inaccessible tests.

Objective: To compare procalcitonin with serial quantitative C-reactive protein (CRP) as biomarkers for guiding antibiotic therapy in children with suspected sepsis, with particular attention to practicality in lower resource settings.

Methods: A critically appraised review of contemporary paediatric literature was undertaken using PubMed/MEDLINE, Embase, CINAHL and the Cochrane Library, supported by hand searching of reference lists. Key papers were selected for direct relevance to paediatric antibiotic decision making, serial biomarker use and low resource applicability.

Results: The direct paediatric evidence favours procalcitonin. A meta-analysis of paediatric randomised trials found that procalcitonin guided care reduced antibiotic duration, while older comparative studies showed better early discrimination of bacterial sepsis than CRP. However, the BATCH trial found that procalcitonin guided care did not significantly shorten intravenous antibiotic duration in children managed within a strong stewardship system, suggesting that benefit is context dependent. Evidence for serial CRP is less direct but clinically relevant. Serial CRP trajectories have been shown to distinguish faster from poorer responders during therapy, and a recent feasibility study from Zanzibar suggested that serial CRP point of care testing can support antibiotic review in a low resource setting. CRP is less specific and slower to change, whereas procalcitonin may be falsely high in non-bacterial inflammation and falsely low in very early, chronic or focal infection.

Conclusions: Procalcitonin has the stronger direct evidence base for antibiotic guidance in children, but serial quantitative CRP remains the more pragmatic option in many resource limited settings because it is cheaper, more available and easier to repeat. Neither biomarker should be used in isolation.

Keywords: Paediatric Sepsis, Procalcitonin, C-reactive Protein, Antibiotic Stewardship, Resource-limited Settings